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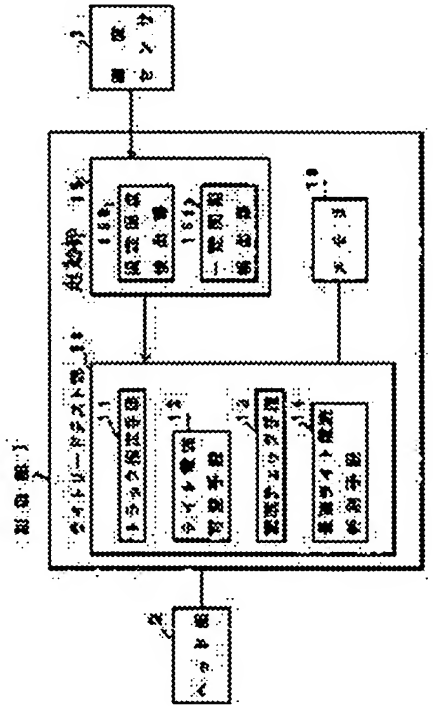
(54) WRITE/READ CONTROL METHOD AND CONTROLLER IN MAGNETIC DISK DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To cancel the variance of individual heads and to enable to cope with also the change in the state of a medium due to the temperature variation as to the write/read control method and the controller in a magnetic disk device provided with a circuit for variably controlling a write current.

SOLUTION: The device is provided with a write/read testing part 10 for deciding the proper write current, and the control for writing data is made by the write/read testing part 10 in the manner of successively changing the write current for every prescribed section plentifully existing on a specified track, and next, the reading of the data between each of the sections and the checking of the error are performed to write the result into a table, then the device is constituted so as to perform the write-in by deciding the write current in the section where the error is not detected at the checking of the table, as the proper write current.



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CLAIMS

[Claim(s)]
[Claim 1] In the light lead control approach in the magnetic disk drive equipped with the circuit which controls a write current to adjustable It has the light lead test section for determining a proper write current. Said light lead test section A sequential change of the write current is made for a majority of every predetermined sections on the specified truck. The write current of the section when control which writes in data is performed at, then reading of the data of each of said section and the check of an error are performed at, a result is written in a table at, said table is checked at, and an error is not detected is determined as a proper write current. The light lead control approach in the magnetic disk drive characterized by writing in.
[Claim 2] In claim 1 said light lead test section By the write current of immobilization which set up the write current beforehand for a majority of every predetermined sections on the specified truck Perform control which writes in data, next a sequential change of the write current is made for a majority of every predetermined sections on the adjoining truck of said appointed truck. Perform control which writes in data, then perform reading of the data of each section of said appointed truck, and the check of an error, write a result in a table, and said table is checked. The light lead control approach in the magnetic disk drive characterized by writing in by determining the write current of the section when an error is not detected as a proper write current.
[Claim 3] In the light lead control approach in the magnetic disk drive equipped with the circuit which controls a write current to adjustable said control section The table on which the write current corresponding to each temperature requirement stored in memory was set up is read. If it detects being contained in the temperature requirement where Wright Read's normal operation is performed, a thermometry is performed in the intervals of said normal operation, and said measured temperature performs a light lead test The Wright Lead control approach in the magnetic disk drive characterized by performing any one of the Wright Lead tests according to claim 1 to 3, and determining and updating a write current.
[Claim 4] In the Wright Lead control unit in the magnetic disk drive equipped with the circuit which controls a write current to adjustable said Wright Lead control unit It has the Wright Lead test section. Said Wright Lead test section A truck assignment means to specify the truck used as the object for a test, and a write current adjustable means to supply the control signal which changes the value of a write current one by one for every predetermined section on the appointed truck, and records data on two or more sections to a head device, The reading check means which checks by being started after said Wright actuation and reading the data of two or more sections of each on said truck, The Wright Lead control unit characterized by having an optimal write current distinction means to determine the optimal write current based on said check result, and performing reading from a magnetic disk drive by said determined optimal write current.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the Wright Lead control approach and control unit in the magnetic disk drive which can change a write current free.
[0002] As for the magnetic disk drive, large capacity-ization is progressing in recent years, and track density is becoming narrow steadily with the increment in capacity. On the other hand, although the core width of face of the magnetic head also becomes small, since error REITO (error rate) will increase if a write current is made small in proportion to this, there is a problem that a write current cannot be made small and the improvement is desired.
[0003]
[Description of the Prior Art] With the increment in the capacity of a hard disk drive unit etc., track density becomes small and the core width of face of the magnetic head is also becoming small steadily. If a write current is enlarged, it writes according to the leakage flux from a head, and a breadth phenomenon occurs, the width of recording track will be exceeded or an adverse effect, such as straddling a contiguity bit signal field, will generate the magnetic head. Moreover, the holding power (HC) of a medium changes with temperature, or the flying height of a head changes, a magnetic-disk medium writes, and the amount of breadth also changes. If it writes and breadth becomes large, the situation which affects the data of the next truck and is eliminated depending on the case will occur.
[0004] Moreover, if there are few write-in currents, error REITO will get worse and a read error will be caused. Conventionally, the average write-in current searched for is beforehand set up as a default about the average magnetic disk drive, and the write-in current was controlled by the value.
[0005] Moreover, even if a temperature change arises, the always optimal write-in current is supplied to the magnetic head, and the technique for preventing lowering of a lead margin is indicated by JP,1-317208,A. The optimum value of the write-in current beforehand set up according to temperature is memorized in memory, the optimum value of the write-in current corresponding to the temperature which detected the temperature of the perimeter of a record medium with the temperature detection means, and was detected at the time of writing is read from memory, and the write-in current which controls a current supply source control means based on the value, and is supplied to the magnetic head is controlled by the technique.
[0006]
[Problem(s) to be Solved by the Invention] When the width of recording track becomes narrow as described above, and head core width of face is also becoming narrow, dispersion in the core width of face at the time of manufacture of a head is also becoming large. Thus, when core width of face varied, with the Wright (writing) current set up by the default, it wrote, and control of the amount of breadth was not completed enough, but there was a problem that will crase the data of the next truck or aggravation of error REITO will occur. Moreover, with dispersion in the over-writing property (property for eliminating old data by overwrite of data) of a head, by the head, when there were few currents, there were problems of enough of starting a flaw and a read error at Wright.
[0007] Furthermore, with the technique which reads the write-in current set up according to the above-mentioned temperature, the temperature of a medium changes with change of environmental temperature, the holding power (HC) of a record medium changes, and since it writes and the amount of breadth also changes, the same problem occurs.
[0008] It aims at offering the Wright Lead control approach and control unit of a magnetic disk drive which this invention can cancel dispersion in each head, and can respond also to change of the medium situation by the temperature change.
[0009]
[Means for Solving the Problem] Drawing 1 shows the principle configuration of this invention. the inside of drawing, and 1 -- a control section and 10 -- a write current adjustable means by which change the Wright Lead test section and 11 into a truck assignment means from size at smallness (or the reverse), and 12 changes a write current into every [on the appointed truck] predetermined section (for example, sector) in order, and 13 -- a read-check means and 14 -- for a laying temperature detecting element and 151, as for memory and 2, a fixed period detecting element and 16 are [an optimal write current distinction means and 15 / the starting section and 150 / the head section and 3] temperature sensors.
[0010] This invention makes actuation by the Wright Lead test section 10 start by starting the Wright Lead test section 10 from the starting section 15. Temperature is beforehand set as the laying temperature detecting element 150 for every fixed spacing, environmental temperature is detected by the temperature sensor 3, and the starting section 15 will be started if it detects having become the temperature set up by the laying temperature detecting element 150. Moreover, whenever it detects having become the fixed period (time amount) beforehand set up in the fixed period detecting element 151 without starting with temperature, you may make it start. If the truck which will perform the Wright Lead test with the truck assignment means 11 if it starts is specified, the signal which moves the head section 2 to a corresponding truck location will generate the Wright Lead test section 10. Next, the Wright current value is first made into size (or smallness) for every predetermined section with the write current adjustable means 12, and Wright actuation of the data which outputted the signal which controls a current value to adjustable to change to a small value in order to the head section 2, and were decided beforehand is controlled.
[0011] Then, it is confirmed whether read the data of each section of the truck which the read-check means 13 operated and performed the

following writing, and an error is detected. Next, from the result of the read check of each section corresponding to each write-in current by the read-check means 13, the exaggerated light property of a head is discerned and a suitable write current is determined. The information on the time amount of the laying temperature leading to starting or a fixed period and the Wright Lead test section 10 start memory 16. With the truck assignment means 11 The information on the specified truck and the value of each write current of each section (sector) of every by the write current adjustable means 12 are stored, and the information on the existence of the error detection for every (every [or] write current value) section by the read-check means 13 is stored further. With the optimal write current distinction means 14 The write current by which an error is not detected is distinguished, and the distinguished optimal Wright current value is set up in a control section, and it directs to the head section 2.

[0012]

[Embodiment of the Invention] Drawing 2 is the configuration of the control section of the magnetic disk drive with which this invention is carried out. While 20 are connected with high order host equipment among drawing and controlling actuation of Read of a magnetic disk drive, Wright, and others according to the command from high order host equipment Read and the Wright data transfer control The disk controller which the control circuit board to perform and 21 are equipped with an interface with high order host equipment, and controls Wright Read of a disk, and 22 between a disk controller 21 and the read/write circuit for the magnetic heads data and the interface of a control signal The Read channel circuit to take, the oscillator which generates the clock signal over the microcontroller unit (MCU) which 23 mentions later with a disk controller 21, and 24 are microcontroller units (it displays by MCU) which control the device section and the actuation circuit of a disk.

[0013] The data buffer which stores the data for the Wright Lead test based on the program and this invention by which 25 controls a disk controller 21 (DRAM), The flash memory which stores the data which use 26 for control of MCU24 (EPROM), The servo controller by which 27 performs access of a head and the roll control of a disk, and 30 Disk enclosure (device circuit which carried out the modularization of the peripheral device of a disk unit), The voice coil motor for positioning the head assembly in which 31 includes the read/write (R/W) pre amplifier circuit of the magnetic head, and 32 includes read-out of a head and a write-in circuit, and 33 on the truck which had the head specified (VCM), A spindle motor for 34 to carry out revolution actuation of the magnetic disk and 35 express a temperature sensor.

[0014] The Wright Lead test by this invention is performed by control of a disk controller 21, the signal which controls a write current to adjustable is given from a disk controller 21 to MCU24, the signal which controls a write current from MCU24 to the R/W pre amplifier circuit 31 is supplied, and the write current by which adjustable control of the R/W pre amplifier circuit 31 was carried out to the head assembly 32 is supplied. Moreover, light data are supplied to the R/W pre amplifier circuit 31 through the Read channel circuit 22 from a disk controller 21.

[0015] Drawing 3 , drawing 5 , drawing 6 and drawing 8 , and drawing 9 show the explanatory view of actuation by the 1st, 2nd, and 3rd approach of the Wright Lead test by this invention, and drawing 4 , drawing 7 , drawing 10 , and drawing 11 are the flow charts for determining the optimal write current by the 1st [of the Wright Lead test], 2nd, and 3rd all directions method.

[0016] In the explanatory view of actuation by the 1st approach of the Wright Lead test shown in drawing 3 , A. shows signs that changed the write current from size to sector a-h of Truck n in order by write head at smallness, and data were written in. The distinction result of whether B. of drawing 3 is errorless when each sector a-h of the truck n written in by above-mentioned A. is read, or there was any error is expressed, and it is the example in which sector a-f does not have an error and which had the error with Sectors g and h in this example.

[0017] The processing flow by the 1st approach shown in drawing 4 is explained. Before processing, as shown in the lower right of drawing 4 , the table corresponding to an error judging is created, the value (I0, I1, ...) of each write current set as adjustable to each number (A0, A1, ...) of a sector is written in, and an error-checking result is set up by the result of a test.

[0018] It moves to the measurement truck (the example of drawing 3 the truck n) beforehand decided to start a test (S1 of drawing 4). next, the write current (I0) which made In=I0 (it is initial value and considers as maximum or the minimum value) by processing of write current setting out (R> 4 drawing 4 S2), set as sector number An=A0 (head location) (said -- S3), and was set as Sector An performs Wright actuation (this S4). Next, Wright actuation is performed using whether n reached maximum (max), and the sector number (An) which updates n+1 (S6 of drawing 4), and corresponds if it has not distinguished and reached and the value which set the write current (In) as the table corresponding to an error judging.

[0019] If it becomes n=max, it will check by ending the Wright actuation and shifting to the Read actuation. that is, it distinguishes whether the sector number was set as An=A0 (S7 of drawing 4), then Read actuation of a sector number An was performed (said -- S8), and the error occurred to the data which acted as Read (this S9). when an error occurs, O.K. will be checked, if NG is checked in the applicable location of the table corresponding to an error judging (S10 of drawing 4) and an error is not detected (said -- S11). Next, n distinguishes in max and the actuation which updates n=n +1 when it is not max (S13 of drawing 4), performs Read actuation of the sector number (An) which returns and corresponds to S8, and performs the judgment of an error and the check to the table corresponding to a judgment result is repeated.

[0020] if n reaches max, it will distinguish where the table corresponding to an error judging was checked and was set to NG, a proper write current will be determined (said -- S14), write current setting out will be changed (said -- S15), and a test will be ended. In the example of the table corresponding to an error judging shown in the right-hand side of drawing 4 , although error checking corresponding to the current value of I2 in error checking to two current values, I0 and I1, is NG and it can be decided in this case by O.K. that it will be a write current I1, a margin may be taken and I0 may be chosen.

[0021] Next, when the explanatory view (that 1) of the 2nd approach shown in drawing 5 and drawing 6 and (its 2) are explained, this 2nd approach is the approach of checking the collection-of-autographs property (effect by the writing to an adjoining truck) of a head. That is, as shown in A. of drawing 5 , Wright actuation is performed to sector a-h of the specific truck n of a record medium with a default fixed current, and Wright actuation is performed, carrying out adjustable [of the current] to sector a-h of the truck n-1 of the next door of Truck n which performed Wright actuation by A. next, as shown in B. (in this example, it changes from a high current to a small current). In this case, since the Wright actuation by B. is committed as a noise to Truck n, the writing of A. and B. uses a different pattern (data).

[0022] Since the data of the truck n of A. are eliminated when the write current of the Wright actuation shown in B. of drawing 5 is large, an error may be caused. Therefore, by judging whether the error occurred into the sector which acted as Read of the truck n after performing Wright actuation of B., as shown in C. of drawing 6 , and acted as Wright with which current, the collection-of-autographs property of a header can be discerned and a suitable write current can be set up.

[0023] The processing flow by the 2nd approach shown in drawing 7 is explained. Before processing, as shown in the lower right of drawing 7 , the table corresponding to an error judging is created. The value (I0, I1, ...) of each write current set as adjustable to each number (A0, A1, ...) of a sector is written in this table, and an error-checking result is set up by the result of a test.
[0024] It moves to the measurement truck (the example of A. of drawing 5 the truck n) beforehand decided to start a test (S1 of drawing 7). Next, a data pattern X performs Wright actuation to a sector A0 - Amax by the default write current (S2 of drawing 7). next, the write current (I0) which moved to the measurement truck -1 (this example n-1) (S3 of drawing 7), set the write current In as I0 (this S4), set as sector number An=A0 (head location) (said -- S5), and was set as Sector An performs Wright actuation (said -- S6). next, Wright actuation is performed one by one using whether n reached maximum (max) and the write current (In) of the value which distinguished (S7 of drawing 7), updated n+1 when not reached (said -- S8), returned to the above S6, and was set up corresponding to the sector number (An) of the table corresponding to an error judging.
[0025] If the sector of the writing to a truck n-1 becomes n=max, it will move to a measurement truck (the truck n of drawing 5) (this S9). next, Read actuation of 0 sector sector An=A An is carried out (said -- S -- 10 and 11). whether the read data have an error and when it distinguishes (S12 of drawing 7) and an error occurs, O.K. will be checked, if NG is checked in the applicable location of the table corresponding to an error judging (said -- S13) and an error is not detected (said -- S14). next, n distinguishes in max (S15 of drawing 7), and the actuation which updates n=n +1 when it is not max (said -- S16), performs Read actuation of the sector number (An) which returns and corresponds to S11, and performs the judgment of an error and the check to the table corresponding to a judgment result is repeated.
[0026] if the last (n=max) of the sector of Truck n is reached, a setting-out change of a write current will be made with where the table corresponding to an error judging was checked and it became NG, and the value which distinguished, it determined (S17 of drawing 7), and continued and determined the write current (said -- S18), and a test will be ended. In the example of the table corresponding to an error judging of drawing 6 , error checking serves as O.K. from the write current I3 (sector A3).
[0027] Drawing 8 and drawing 9 are the explanatory view (the 1) of the 3rd approach of the Wright Lead test, and (its 2). This 2nd approach is an approach for discerning the over-writing property (property that the original data can be deleted by overwrite) of a head.
[0028] As shown in A. of drawing 8 , Wright actuation is performed to sector a-h of the specific truck n of a record medium with a default fixed current, and Wright actuation is performed one by one, carrying out adjustable [of the current] to sector a-h of the truck n-1 of the next door of Truck n which performed Wright actuation by A. next, as shown in B. of drawing 8 (in this example, it changes from a high current to a small current). In this case, since the Wright actuation by B. is committed as a noise to Truck n, the writing of A. and B. uses a different pattern (data). Since the data of the truck n of A. are eliminated when the write current of the Wright actuation of B. is large, an error may be caused. Then, the collection-of-autographs property of a head can be discerned by judging whether the sector which acted as Read of the truck n as shown in C. of drawing 9 , and acted as Wright with the current of a throat to the adjoining truck n-1 of B. is an error. Moreover, when it acts as Read of the truck n-1 which acted as Wright by B. as shown in D. of drawing 9 , and it acts as Wright with which current, the exaggerated light property of a head can be discerned by judging whether it is errorless. By this 3rd approach, if the mean value of the write current determined by C. of drawing 9 and the write current determined by D. is chosen, a still more suitable write current can be set up.
[0029] Drawing 10 , the processing flow (the 1) by the 3rd approach shown in drawing 11 , and (its 2) are explained. Before processing, the table corresponding to an error judging as shown in the drawing 11 bottom is created. The value (I0, I1, ...) of each write current set as adjustable to each number (A0, A1, ...) of a sector is written in this table, and the column corresponding to two items of error checking 1 and error checking 2 is prepared as an error-checking result.
[0030] It moves to the measurement truck (the truck n of the example of A. of drawing 8) beforehand decided to start a test (S1 of drawing 10). Next, a data pattern X performs Wright actuation to a sector A0 - Amax on Truck n by the default write current set up beforehand (S2 of drawing 10). next, it moves to the measurement truck -1 (truck n-1 shown in B. of drawing 8) (S3 of drawing 10), a write current In is set as I0 (this S4), a sector number An is set as A0 (said -- S5), and a data pattern Y (a clearly different pattern from the above-mentioned data pattern X) performs Wright actuation into Sector An (said -- S6).
[0031] Next, if the sector of the writing to the measurement truck -1 becomes n=max, it will move to a measurement truck (the truck n shown in C. of drawing 9) (S9 of drawing 10). next, as sector An=A0, Read actuation of (S10 of drawing 10) and the sector An is carried out (said -- S11), and it distinguishes whether the read data have an error (said -- S12). when an error occurs, if NG is checked in the applicable location of the error checking 1 of the table corresponding to an error judging (S13 of drawing 10) and an error is not detected, O.K. will be checked in the applicable location of the error checking 1 of said table (said -- S14). next, n distinguishes in max (S15 of drawing 10), when it is not max, n=n +1 is updated (said -- S16), Read actuation of the sector number (An) which returns and corresponds to S11 is performed, and the actuation which checks judgment of an error and error checking 1 of the table corresponding to a judgment result is repeated.
[0032] If n is set to max, it will move to the measurement truck -1 (truck n-1 of D. of drawing 9) (S17 of drawing 11). here, it is set as sector An=A0 (S18 of drawing 11), and Read actuation of the sector An is carried out (said -- S19). when the data which acted as Read by this distinguish in an error (S20 of drawing 11) and detect an error, if NG is checked in the applicable location of the error checking 2 of the table corresponding to an error judging (S21 of drawing 11) and an error is not detected, O.K. will be checked in the applicable location of the error checking 2 of said table (said -- S22). next, n distinguishes in max (S23 of drawing 11), and when it is not max, n=n +1 is updated (said -- S24), and the Read actuation of the sector number (An) which returns and corresponds to S19 and the judgment of an error, and the check of the table corresponding to a judgment result are repeated, and are performed. if n is set to max, with reference to error checking 1 and error checking 2 of a table, it will distinguish whether it is O.K. in which range, write current setting out will be changed with the value which determined and (S25 of drawing 11) determined the write current (said -- S26), and a test will be ended.
[0033] In the example of the table corresponding to an error judging shown in the lower part of drawing 11 , by error checking 2, at error checking 1, to a write current I3, since it is O.K. from a write current I1 in O.K., it becomes write current =(I1+I3)/2=I2, and as for a write current, I2 is chosen.
[0034] What is necessary is to carry out adjustable [of the write current] to smallness (or fossete size) from size, to act as Wright of the consecutive sector by the 1st [of the Wright Lead test shown in above-mentioned drawing 3 thru/or drawing 11], 2nd, and 3rd all directions method, when carrying out adjustable [of the write current], but just to memorize with which current it acted as Wright of which sector with the means as shown in the above-mentioned table corresponding to an error judging, even when the sequence of a current is scattering. Moreover, similarly, if it memorizes with which current it acted as Wright of which sector, the sector which acts as Wright

does not need to be continuing. Furthermore, it is considering as the same truck for shortening test time amount, and if allowances are in test time amount, it may test with a multiple track. in order [moreover,] to make a test result into accuracy more -- abundance -- you may make it repeat the same test

[0035] Next, it is shown in drawing 1212 thru/or drawing 14 which carries out the above 1st thru/or 3rd Wright Lead test with what kind of gestalt, or is explained below. Drawing 12 is the processing flow of the example 1 which performs the Wright Lead test. In this example 1, the Wright Lead test is performed for every fixed time amount.

[0036] first, by setting a power source to ON, a magnetic disk drive is operated (S1 of drawing 12), a timer is cleared (said -- S2), a timer is set to ON (said -- S3), and normal operation of a magnetic disk drive is performed (this S4). then, if it distinguishes (S5 of drawing 12) and becomes the setup time, the Wright Lead test will be performed (said -- S6), a write current decision of whether it became the setup time of a timer is made from that result, and it updates to the value which determined the value which resembled the magnetic disk drive till then and was set as it (said -- S7).

[0037] By the approach of the example 1 of this drawing 12 , error REITO can be improved corresponding to change of a temperature situation. Drawing 13 is the processing flow of the example 2 which performs the Wright Lead test. The Wright Lead test is performed by change of temperature, the temperature pair write current table which wrote the write current corresponding to temperature in nonvolatile memory beforehand is prepared, and this example 2 uses the detection temperature of a temperature sensor (35 of drawing 2).

[0038] a magnetic disk drive is first operated by setting a power source to ON (S1 of drawing 13), and a temperature pair write current table is read from nonvolatile memory etc. (said -- S2). then, normal operation of a magnetic disk drive is performed (S3 of drawing 13), a thermometry is performed between them (this S4), and it distinguishes in the temperature point with which that temperature tests (said -- S5). This temperature point will distinguish whether it became which the temperature point at step S5, if the temperature point (for example, 10-degreeC, 15-degreeC, 20-degreeC, 25-degreeC, 30-degreeC) shall be set up for example, so that it may test for every 5-degreeC beforehand. when it is not the temperature point, return normal operation is performed to step S3, if it detects having become the temperature point, the above-mentioned Wright Lead test will be performed (S6 of drawing 13), a write current will be determined, and the value till then will be updated (said -- S7). Then, it returns to S3 and normal operation is performed.

[0039] According to the approach of the example 2 of drawing 13 , receiving effect in a temperature change in the Wright Lead of a magnetic disk drive by testing write current optimization in a specific sector for every temperature change is lost.

[0040] Drawing 14 is the processing flow of the example 3 which performs the Wright Lead test. In this example 3, the write current recorded on the temperature pair write current table is used about a temperature requirement [finishing / measurement].

[0041] a temperature pair write current table is read from nonvolatile memory etc. after power-source ON (S1 of drawing 14) (said -- S2). then, normal operation of a magnetic disk drive is performed (S3 of drawing 14), and it distinguishes in the temperature point with which the temperature which performed the thermometry (the value of a temperature sensor is detected) (this S4), and was detected at those intervals tests (said -- S5). this temperature point has the same semantics as step S5 of above-mentioned drawing 13 , if it is not the temperature point, it will return to S3, but if it is the temperature point, it will distinguish in a measured temperature requirement (said -- S6). In addition, the proper write current determined as the check field which expresses whether it is finishing [measurement (Wright Lead test)] corresponding to each temperature point (a temperature requirement and homonymy) by that measurement shall be stored in the temperature pair write current table (it reads by the above S2 and is settled) used for this distinction.

[0042] finishing [a setting-out change is made with reference to a table (drawing /S11 / 1414), and / the return and measurement to the normal operation of step S3] when it turns out in this distinction that it is a temperature requirement [finishing / measurement] -- it is not -- a case performs the Wright Lead test (S7 of drawing 14), and updates it to the value which determined the write current and determined the present write current of a magnetic disk drive (said -- S8). Next, a measured check is added to the present temperature requirement in temperature pair write current tables, such as nonvolatile memory, (S9 of drawing 14). next, temperature pair write current tables, such as nonvolatile memory, are updated (said -- S10), and it returns to the normal operation of step S3.

[0043] After testing at a certain temperature, determining an optimum value and memorizing on a table by the approach of this example 3, at the temperature experienced once, by using that value, the count of a test can be reduced and processing speed can be improved.

[0044] In the example 2 of above-mentioned drawing 13 , and the example 3 of drawing 14 , although a temperature pair write current table can be written in on nonvolatile memory and can be held, it is written in the specific sector of the record medium of a magnetic disk, and can be read from here.

[0045]

[Effect of the Invention] According to this invention, even if the head core of the head section of a magnetic disk drive is not settled in the fixed range, but writes and the amount of breadth varies according to equipment, the holding power (HC) of the record medium by temperature changes, and even if it writes and the amount of breadth changes By testing using the circuit to which a write current can be changed, and being able to set up the write current according to an environment, without having an adverse effect on the next truck, error REITO can be reduced and improvement in a property can be realized.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is drawing showing the principle configuration of this invention.
[Drawing 2] It is drawing showing the configuration of the control section of the magnetic disk drive with which this invention is carried out.
[Drawing 3] It is the explanatory view of actuation by the 1st approach of the Wright Lead test.
[Drawing 4] It is drawing showing the processing flow by the 1st approach.
[Drawing 5] It is the explanatory view (the 1) of actuation by the 2nd approach of the Wright Lead test.
[Drawing 6] It is the explanatory view (the 2) of actuation by the 2nd approach of the Wright Lead test.
[Drawing 7] It is drawing showing the processing flow by the 2nd approach.
[Drawing 8] It is the explanatory view (the 1) of actuation by the 3rd approach of the Wright Lead test.
[Drawing 9] It is the explanatory view (the 2) of actuation by the 3rd approach of the Wright Lead test.
[Drawing 10] It is drawing showing the processing flow (the 1) by the 3rd approach.
[Drawing 11] It is drawing showing the processing flow (the 2) by the 3rd approach.
[Drawing 12] It is the processing flow of the example 1 which performs the Wright Lead test.
[Drawing 13] It is the processing flow of the example 2 which performs the Wright Lead test.
[Drawing 14] It is the processing flow of the example 3 which performs the Wright Lead test.
[Description of Notations]
1 Control Section
10 Wright Lead Test Section
11 Truck Assignment Means
12 Write Current Adjustable Means
13 Read-Check Means
14 Optimal Write Current Distinction Means
15 Starting Section
150 Laying Temperature Detecting Element
151 Fixed Period Detecting Element
16 Memory
2 Head Section
3 Temperature Sensor

[Translation done.]